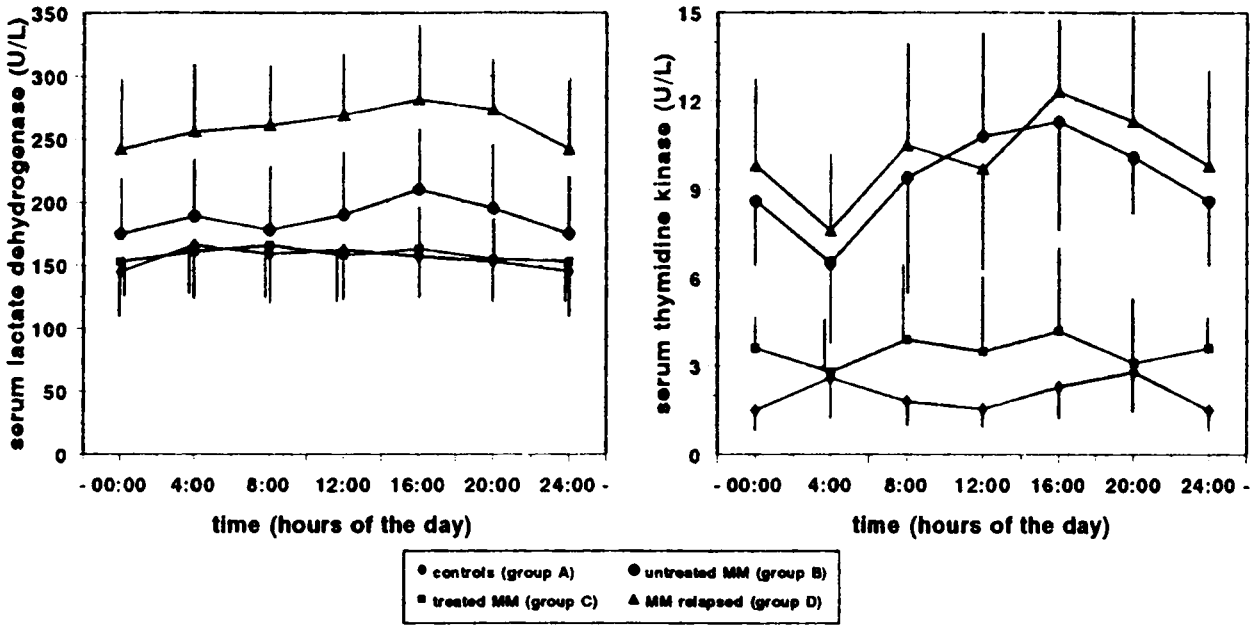

Variable	group	PR	p	mesor (SE)	amplitude (95%CL)	acrophase (95%CL)	time (95%CL)
	A	50	>0.05	157.0 (3.7)	0.7 (- # -)	-140° (- # -)	9:20 AM (- # -)
sLDH	B	57	<0.05	189.5 (5.3)	12.3 (0.1#24.5)	-243° (-187°#-299°)	4:12 PM (12:28 PM # 7:56 PM)
(U/L)	C	53	>0.05	159.6 (4.7)	4.6 (- # -)	-145° (- # -)	9:40 AM (- # -)
	D	71	<0.02	263.5 (6.6)	15.4 (5.2#25.6)	-224° (-186°#-262°)	2:56 PM (12:24 PM # 5:28 PM)
	A	26	>0.05	2.08 (0.27)	0.19 (- # -)	-317° (- # -)	9:08 PM (- # -)
sTK	B	78	<0.03	9.45 (0.38)	2.13 (1.31#2.95)	-228° (-202°#-254°)	3:12 PM (1:28 PM # 4:56 PM)
(U/L)	C	46	>0.05	3.52 (0.33)	0.37 (- # -)	-207° (- # -)	1:48 PM (- # -)
	D	66	<0.04	9.98 (0.48)	2.70 (1.34#4.06)	-249° (-203°#-295°)	4:36 PM (1:32 PM # 7:40 PM)

PR = percentage of rhythm; 95%CL = confidence limits at 95% of probability.

Fig. 1. Diurnal fluctuations (mean ±1 SD) of serum lactate dehydrogenase (sLDH) and serum thymidine kinase (sTK) levels in the four studied groups and results of the "mean-group cosinor" analysis.

in programming a treatment scheme according to time, and (3) be a new and useful approach for monitoring patients with MM.

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Atypical Follicular Hyperplasia With Clonal Rearrangement for Immunoglobulin and T-Cell Receptor Genes: Biclonal Proliferation of B Cell and T Cell

To the Editor: Angioimmunoblastic lymphadenopathy with dysproteinemia (AILD) [1,2] and immunoblastic lymphadenopathy (IBL) [3] can best be described as disorders of T cells resulting in polyclonal B-cell proliferation. Pathological findings of the involved lymph nodes include prominent obliteration of the nodal architecture with capsular infiltration, vascular prolifera-

TABLE I. Results of Immunogenotypic Analyses in Sequential Lymph Node Biopsies*

	February 1990 (the first biopsy)	July 1992 (the third biopsy)	December 1993 (the last biopsy)
TCR β	R	R	R
TCR γ	R	ND	R
JH	R	G	G
Jκ	G	ND	ND
Jλ	G	ND	ND

R, rearrangement; G, germline; ND, not done; JH, the joining region of the immunoglobulin heavy chain; TCR, T-cell receptor.
*The lymph node obtained from the second biopsy was not large enough to make immunogenotypic analyses possible.

(AILD) [1,2] and immunoblastic lymphadenopathy (IBL) [3] can best be described as disorders of T cells resulting in polyclonal B-cell proliferation. Pathological findings of the involved lymph nodes include prominent obliteration of the nodal architecture with capsular infiltration, vascular proliferation, immunoblastic proliferation, and amorphous eosinophilic interstitial deposits. Although residual follicles, or "burst-out" germinal centers, are found in some cases [2], there is no follicular hyperplasia in AILD/IBL.

A 61-year-old man was hospitalized for evaluation of general lymphadenopathy in January 1990. He had diffuse lymphadenopathy up to 3 cm in the cervical, axillary, and inguinal regions; mild splenomegaly; and skin eruption. Abnormal laboratory data included a Westergren sedimentation rate of 66 mm/hr, polyclonal IgG and IgM elevations of 3,836 mg/dl and 278 mg/dl, and a positive Coombs' direct test. Abdominal computed tomographic and gallium scans revealed diffuse lymphadenopathy in the mediastinal, axillary, and periaortic regions. Rt-inguinal lymph node biopsy (the first biopsy) showed atypical follicular hyperplasia. Bone marrow aspiration was normal. Diffuse lymphadenopathy and polyclonal hypergammaglobulinemia were improved after administration of prednisone; the dose was tapered to 10 mg a day, and the patient was maintained in remission. In September 1991 (the second biopsy) and July 1992 (the third biopsy), he had diffuse lymphadenopathy, which was improved after transient increase of prednisone and/or administration of cyclophosphamide. In December 1993, he had diffuse lymphadenopathy in the cervical, axillary, and inguinal regions. Lt-inguinal lymph node biopsy (the last biopsy) revealed T-cell lymphoma. He was admitted and treated with combined chemotherapy (vincristin, cyclophosphamide, prednisone, and doxorubicin), resulting in clinical remission.

The sequential lymph node biopsies revealed the histological changes. The first biopsy showed the preserved nodal architecture with prominent germinal centers and marked interfollicular cellular infiltrate composed of small and medium lymphocytes, basophilic immunoblasts, and plasma cells. Progression of the morphologic features was characterized by decreases of follicular hyperplasia, nodal architecture effacement, and increases of immunoblast proliferation. The last biopsy revealed monomorphic infiltrates of large lymphoid cells in cluster, which was interpreted as diffuse large cell-type non-Hodgkin's lymphoma. In immunophenotypic analysis, lymph node cell suspensions from the first biopsy showed a preponderance of CD20+ and κ chain+ cells in comparison with λ chain+ cells. On subsequent analysis, this preponderance had disappeared since the second biopsy. The last biopsy showed increases of CD4+, CD5+, and CD7+ cells. Sequential immunogenotypic analysis was performed on lymph node cells obtained from the first, third, and last biopsies (Table 1). The first biopsy showed clonal rearrangement of T-cell receptor (TCR) β chain, TCR γ chain, and the joining region of the immunoglobulin heavy chain (JH) gene. Jκ and Jλ genes were in the germ-line configuration. The third and last biopsy also showed the monoclonal band of rearrangement of TCR β chain and TCR γ chain but JH gene was in the germ-line configuration. The rearranged band was found at the same position on electrophoresis, but its relative intensity increased at the last biopsy as compared with residual germ-line bands found on the same electrophoresis lane.

In the present study, we report a patient with progression from atypical follicular hyperplasia to T-cell lymphoma. This clinical picture has a certain similarity to AILD/IBL. In particular, they share diffuse lymphadenopathy with hypergammaglobulinemia, clonal rearrangement of the TCR gene, and progression from the prelymphoma state to malignant lymphoma. However, major differences do exist. A critical histological feature of AILD/IBL is prominent obliteration of normal lymph node architecture. The first biopsy of our case showed follicular hyperplasia in association with a preponderance of κ chain+ cells and clonal rearrangement of the JH gene. Rearrangement of both TCR and Ig genes has been reported in some lymphoid malignancies [4], including AILD [5], and both rearrangements are considered to be present on the same malignant clone. In our case, TCR and Ig genes are suggested to be rearranged in the respective clones. This hypothesis of biclonal proliferation of B cells and T cells explains the unique pathological feature at presentation and progression to T-cell lymphoma.

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Pseudohyperphosphatemia in Multiple Myeloma

To the Editor: Hyperphosphatemia is usually seen in patients with renal failure, hypoparathyroidism, pseudohypoparathyroidism, lactic acidosis, and tumor lysis syndrome. Hyperphosphatemia has been rarely observed in patients with multiple myeloma who have normal renal function. During the last 3 years, we have encountered four patients with multiple myeloma who presented with hyperphosphatemia.

Patients and disease characteristics are shown in Table I. All patients were previously untreated and had typical disease features. During their initial evaluation, a striking hyperphosphatemia was found, and this abnormality persisted on three separate blood measurements for each patient. No patient had clinical signs of hyperphosphatemia, such as tetany or soft tissue calcifications. Serum phosphorus levels were determined by a standard assay during which a known volume of serum was allowed to react with ammonium molybdate in acidic solution to form yellow phosphomolybdate complex, which then was directly quantified photometrically by DMA's UV phosphorus procedure [1]. All patients had normal renal function and serum calcium levels. Concentrations of calcium and phosphorus in a 24 hr urine collection were also normal. There was no evidence of acidosis. Serum levels of cholesterol, triglycerides, bilirubin, uric acid, parathyroid hormone, 1,25-dihydroxyvitamin D, and thyroid function tests were within normal limits (data not shown). Thus, spurious hyperphospha-